wherein the impact matrix data is adapted for use in allocating the frequency channels in the network service area.

REMARKS

This Amendment and Response is filed in response to the Office Action mailed January 24, 2002.

The Examiner is requested to acknowledge the IDS submitted herewith.

Claims 1, 3, 5, 6, 8, 1-12, 18-22 and 26 are amended to improve readability, and new claims 27-40 are presented. The amendments to the claims do not change the scope of the claims or raise any issues which require reconsideration by the Examiner. If the Examiner interprets the amendments as changing the scope of any claim, the Examiner is respectfully requested to so state and explain the reasoning for such an interpretation.

Claims 27, 30, 34 and 38 are based on the specification, page 18, next to last line, to page 19, line 7. Claims 31 and 35 are based on claim 20. Claims 28, 32 and 36 are based on claim 21. Claims 29, 33 and 37 are based on claim 22. Claims 39 and 40 are based, e.g., on claim 1 and the specification, page 14–15, bridging sentence.

Claims 1, 2, 5, 8, 9, 13-16 and 19 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 5,926,762 to Arpee. Applicants respectfully traverse the rejection. Arpee discusses a method for predicting cellular telephone interference by using measured signal level data that is obtained from drive tests (column 8, lines 35-42). Arpee states that his solution avoids the problem of a prior approach of using predictive software that accounts for the terrain and cell station characteristics to determine antenna locations that provide optimum coverage with minimum interference. With this prior approach, once the antenna locations are identified and frequencies are assigned, plots are used to determine positions where interference is likely to occur, and drive tests are conducted at those positions to determine whether interference in fact occurs (column 7, lines 35-58). If there is interference, the groups of channels assigned to a cell are changed or cell characteristics such as antenna tilt or power are changed. In contrast, Arpee's system relies on measured signal level data for an entire system (e.g., obtained from drive tests) to provide predictive plots for establishing cell site positions and channel assignments (column 8, lines 35-43).

For a new system, Arpee uses predictive plotting software only to select expected cell sites, places test transceivers at the proposed sites and measures signal strength data, again using a drive test (column 8, lines 46-62). A database of signal strength measurements is then used to determine the cell or sector from which each signal received by the mobile unit was sent (column 9, lines 7-15). Arpee further teaches that a propagation model may be used to interpolate missing channels measurements (column 9, lines 48-51). The interpolated measurements are used in a database with the non-interpolated measurements. Accordingly, Arpee relies strictly on signal strength measurements to form a database for use in minimizing interference between cells and, in fact, appears to teach against reliance on signal propagation analysis.

In contrast, Applicants' invention as set forth in claim 1 refers to a method of generating an impact matrix for use in allocating frequency channels in a wireless communication network service area, where signal propagation analysis data and empirical measurement data are merged to determine an anticipated signal level for each one of the plurality of pixels in the network service area. As seen from the above discussion, Arpee is concerned only with developing a database of signal strength measurements, not with using both signal propagation analysis data and empirical measurement data and, in fact, appears to teach against reliance on signal propagation analysis. As a further result, Arpee does not teach determining channel interference impact scores as claimed. Moreover, in a further significant distinction, Applicants' invention is concerned with the pixel level, which is a subset of a sector, which in turn is a subset of a cell, while Arpee provides no mention of pixel-based analysis.

In view of the above, claim 1 is believed to clearly distinguish over Arpee for at least the above-mentioned reasons, and withdrawal of the rejection thereunder is respectfully requested. Moreover, since claim1 is patentable, the dependent claims thereof are also patentable. Furthermore, the dependent claims themselves set forth various novel and non-obvious features.

For example, claim 2 sets forth that the merging of the propagation analysis with the empirical measurement data is performed according to user-ascribed confidences. For example, if it is known that, for a certain area, the RF propagation analysis data will be incorrect or skewed, a user may assign more confidence to the empirical measurement data for that certain area (specification, page 13, lines 8-10). Arpee clearly fails to disclose or suggest this feature. The passage cited by the Office Action (column 11, lines 56-58) only refers to using input configuration data regarding power levels and antenna tilt in a process for comparing the signal

levels of channels serving a point to signal levels of interfering signals (column 11, lines 53-56). This is not related to using user-ascribed confidences as claimed.

Regarding claim 5, Arpee fails to disclose or suggest modifying impact scores according to channel pairing relationships.

Regarding claim 8, referring also to the comments above, Arpee is not concerned with determining interference impact scores as claimed, nor is Arpee concerned with a pixel level analysis as claimed.

Regarding claim 9, again referring to the previous comments, Arpee is not concerned with means for determining a signal strength for each pixel in the network service area that comprises means for conducting a propagation analysis and means for performing empirical measurements. Instead, Arpee relies only on a database of signal strength measurements, and is concerned with cells or sectors rather than pixels.

Regarding claims 13-16, Arpee does not disclose or suggest modifying an impact matrix using co-channel assignments as claimed. The passage cited in the Office Action (column 2, lines 2-4) refers to changing characteristics of the cells to determine the effect on interference. Although Arpee's discussion is unclear, this may involve planned power levels and antenna tilt (see column 11, lines 51-53). These are physical changes to the network that will affect the drive test measurements. In contrast, the modifying or adjusting of an impact matrix using co-channel assignments as claimed by Applicants can be performed according to data which defines sector pairs for which it is known that a channel assignment, either co-channel or adjacent channel, will result in excessive interference (specification, Figure 8, step 158, page 24, lines 6-10).

Regarding claim 19, and the passage cited in the Office Action, Arpee's changing of the physical characteristics of a cell to determine the effect on interference in subsequent drive tests is not analogous to Applicants' providing an impact matrix that allows a user to make and evaluate individual channel assignments in a communication network service area.

Claims 23-25 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 5,293,640 to Gunmar. Applicants respectfully traverse the rejection.

Gunmar is concerned with a system for planning radio cells that generates an exclusion matrix based on measured field strengths, where the exclusion matrix specifies, in symbolic form, the interference ratios between stations in different coverage areas (column 4, lines 29-32). If the estimated traffic demand cannot be handled by the current allocation scheme, adjustments

can be made such as changing the coverage area of a cell (e.g., by changing transmitter power), combining cells, or allocating a different number of channels to a cell.

In contrast, Applicants' claim 23 sets forth a method of using an impact matrix for frequency channel planning in a wireless communication network which includes determining an incremental quality degradation for a potential channel assignment in the network using the impact matrix, and assigning frequency channels to sectors according to the incremental quality degradation provided by the impact matrix. Thus, Applicants' system enables a system engineer to use the matrix to plan the frequency channel allocations before an actual implementation. In this way, if the resulting quality degradation is unacceptable, the frequency channel allocations are not implemented. See the specification, page 26, lines 9-15. The Gunmar system cannot achieve this benefit since it uses an exclusion matrix that is newly calculated based on a modified transmitter power, antenna arrangement, or coverage area size (column 10, lines 28-38). Thus, the Gunmar exclusion matrix reacts to network changes rather than assisting in planning of such changes. Moreover, Gunmar is concerned with assigning frequency channels to cells rather than sectors as set forth in claim 23.

Accordingly, claim 23 and the dependent claims thereof are believed to distinguish over Gunmar.

In view of the above, each of the presently pending claims is believed to be in condition for immediate allowance, and the Examiner is respectfully requested to pass this application on to an early allowance. If there are any further issues that need to be addressed, the Examiner is respectfully requested to telephone Applicants' undersigned representative.

Respectfully submitted,

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Ralph F. Hoppin

Ralph F. Hoppin, Reg. No. 38,494
BROWN RAYSMAN MILLSTEIN FELDER & STEINER, LLP
900 Third Avenue
New York, NY 10022
Tel. (212) 895-2000 Fax (212) 895-2900

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Ralph F. Hoppin — 5-24-02

Ralph F. Hoppin — Date